SUPERFUND Proposed Plan

Northwest Pipe and Casing / Hall Process Company Site
Clackamas, Oregon

U.S. Environmental Protection Agency January 2000

INTRODUCTION

This Proposed Plan identifies the United States Environmental Protection Agency's (EPA) recommendation for cleaning up soil contaminated with polynuclear aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs) and to a lesser extent with chlorinated volatile organic chemicals (VOCs) at the Northwest Pipe and Casing/ Hall Process Superfund site in Clackamas, Oregon. It is based on information collected in a Remedial Investigation (RI) and Feasibility Study (FS) conducted at the site.

The objectives of the RI and FS are to determine the extent of contamination at the site, and to evaluate alternatives to address threats or potential threats to people or the environment posed by the site. This plan provides a brief background on the site, describes the alternatives analyzed and identifies EPA's preferred alternative for addressing contaminated soil. In the future , EPA will issue a separate Proposed Plan for cleanup of contaminated groundwater at the site.

This Proposed Plan, the RI and FS reports, as well as other pertinent documents are available for review at the site Information Repository (see page 15 for more information). The entire administrative record for the site is also available at these locations. These documents can be consulted for in-depth details on the development and evaluation of EPA's recommendation and the other alternatives considered. EPA is issuing this Proposed Plan as part of its public participation responsibilities under section 117(a) of the Comprehensive Environmental, Response, Compensation, and Liability act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA).

HOW YOU CAN PARTICIPATE

Public input on the alternatives and the information that supports these alternatives is an important contribution to the cleanup remedy selection process. Based on new information or public comment, EPA may select another alternative presented in this plan or modify the preferred alternative. The public is encouraged to review and comment on all technologies and alternatives considered for the site.

EPA will consider public comments received during the public comment period before choosing a final action for the site. The final action will be described in the Record of Decision (ROD), which will include EPA's response to comments. The ROD will explain which cleanup alternative is selected.

SITE BACKGROUND

The NW Pipe and Casing/Hall Process Company site covers property located between Southeast Lawnfield and Mather Roads in Clackamas County, Oregon (see Figure 1 on the next page). For EPA's investigation the site was divided into two parts, Parcel A (21 acres) and Parcel B (32 acres). Beginning in 1956, Hall Process Company (HPC) operated a pipe-coating facility on Parcel B. Beginning In 1967 and until operations ceased in 1985, Northwest Pipe and Casing Company (NWPC) manufactured and stored steel pipe on Parcel A. In 1978, HPC ceased operations and the pipe-

How To Comment

EPA will accept written comments on the Proposed Plan during a public comment period from **January 31 to February 29, 2000.** Comments should be addressed to:

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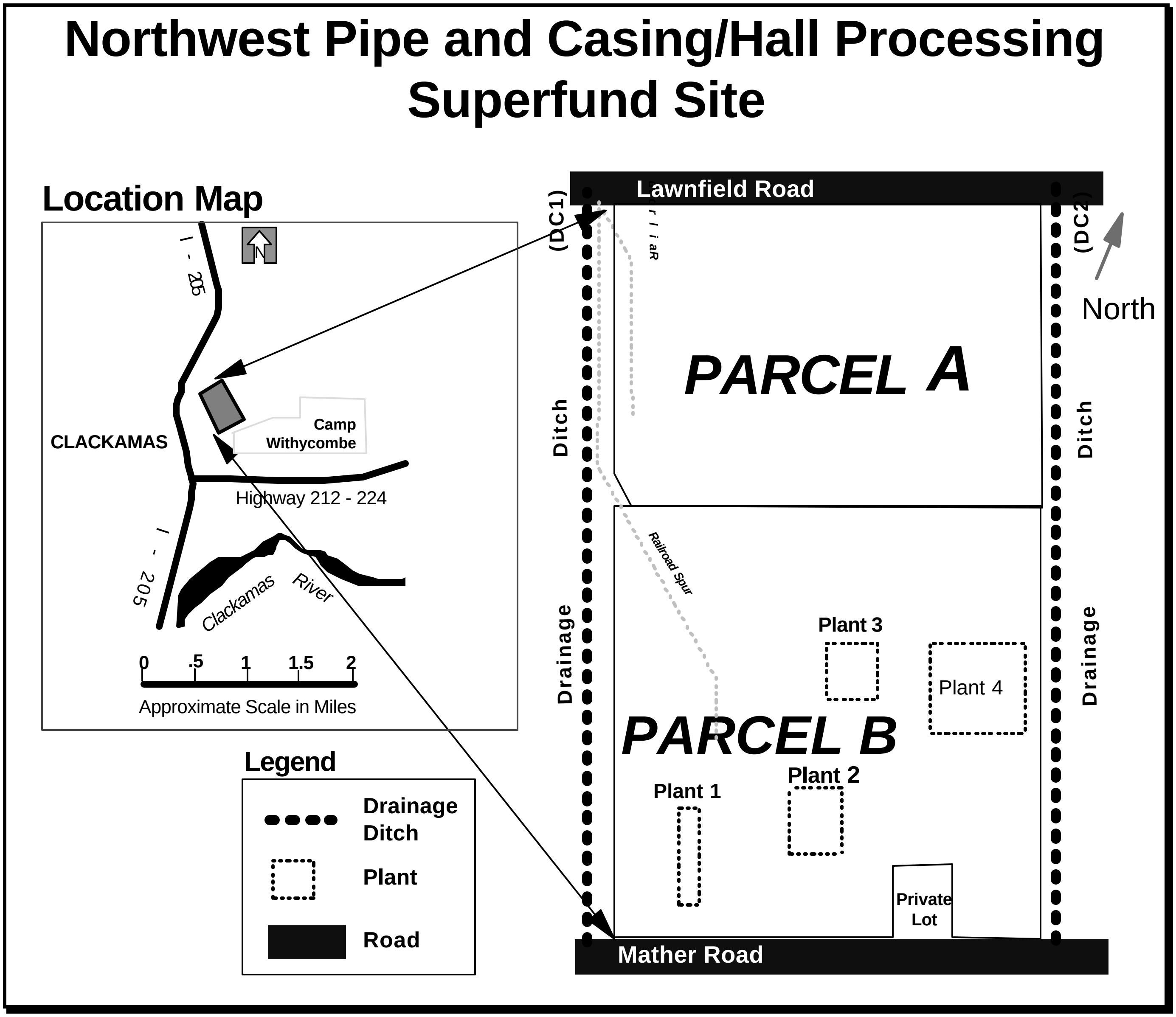
EPA will hold a public meeting to discuss alternatives. Oral and written comments will be accepted at the meeting.

DATE: **February 8, 2000**
TIME: **6:30 - 8:30 PM**
PLACE: **North Clackamas County Chamber of Commerce**
OIT Conference Center
7740 SE Harmony Road
Milwaukie, Oregon

FIGURE 1



coating facility was leased to NWPC, which continued pipe-coating until 1985.

Pipe coating operations involved sandblasting pipe with steel shot, spraying the pipes with primer, and applying the coating material. Coal tar, coal tar epoxy, asphalt, polyethylene epoxy, and concrete were used as coating materials. A volatile-organic based primer was used to adhere pipe coatings and solvents were used in the maintenance of pipe-coating equipment.

On Parcel A some used solvents, oil and water mixtures and metal filings were disposed of directly on the ground. Wastes from the pipe-coating operations were also disposed at various locations on Parcel B by burial, dumping, burning and spreading. These wastes included used solvents from maintenance activities, primers, excess coating material (coal tar), coating product containers, condensed coal tar residues and oils, pipe trimmings, and engine and hydraulic oils. Leaks and spills from equipment and containers also occurred on Parcel B.

In 1985, the western portion of Parcel A (12 acres) was sold by NWPC to the Oregon Department of Transportation (ODOT) which has occupied the site as an equipment warehouse/office facility. The eastern lot of Parcel A (9 acres) was sold in 1985 to Northwest Development Company (NWD) which constructed three low-rise buildings which are currently occupied by several commercial businesses.

In 1997 and 1998, legal agreements between EPA, the State of Oregon and the former facility and property owners and operators, including NWPC, Wayne C. Hall, Jr., ODOT, and NWD, were entered in federal court. The agreements released these parties from future responsibility for site cleanup, in return for monetary payments to EPA and the State of Oregon to be used for cleanup. The settlement with Wayne C. Hall, Jr. included transfer of ownership of Parcel B to the Oregon Department of Environmental Quality (DEQ), in trust for EPA and DEQ.

The land near this site is primarily used for industrial and commercial purposes. A small cluster of homes is located approximately one-half mile southeast of the site.

Cleanup Actions and Protective Measures Taken to Date

In 1988, DEQ unsuccessfully attempted to require the responsible parties to remove highly contaminated material and to perform an investigation of the site. EPA subsequently conducted a limited field investigation of the site and in October 1992 placed the Site on the Superfund National Priorities List (NPL). In 1992, EPA demolished dilapidated buildings and installed security fencing on Parcel B. In 1999, EPA initiated routine security patrols of Parcel B, to keep trespassers off the site.

In 1997, EPA removed approximately 230 tons of surface debris, including coal tar-filled metal tubs, coal tar chunks, scrap metal, wood debris, automobile tires and batteries from Parcel B. This action further reduced the potential for direct human contact with hazardous materials. Two underground storage tanks and 77 tons of petroleum-contaminated subsurface soils on Parcel B were removed in December 1998.

SCOPE AND ROLE OF THIS RESPONSE ACTION

This Proposed Plan presents and evaluates clean up alternatives for contaminated soils at the site.

Presentation and evaluation of clean up options for groundwater will be made, in the future, in a separate Proposed Plan. EPA will also provide a 30-day public comment period for the groundwater plan during which you can comment on the alternatives.

EPA's baseline human health and ecological risk assessment indicates that concentrations of site-related contaminants in surface water and creek sediments downstream from the site do not pose significant risks to humans or the environment. Because of this EPA does not plan clean up of surface water or creek sediments.

NATURE AND EXTENT OF CONTAMINANTS

Past disposal and mishandling of wastes from pipe manufacturing and pipe coating operations are the primary sources of contamination at the site.

Soils

Many areas of surface and subsurface soil on Parcel B are contaminated with polynuclear aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs) and to a lesser extent with chlorinated volatile organic chemicals (VOCs). Coal tar used for coating pipes was the main source of PAHs in the soils. PCBs in the soil most likely originated from cutting oils, hydraulic oils, cooling oils, and/or electrical transformers used at the site. PCB contaminated oils may have been used for on-site dust suppression since they are detected in surface soils over much of the site.

No major sources of contamination were found in soils on Parcel A. However, soil sampling on Parcel A was very limited due to the extensive coverage by buildings and paved areas. Concentrations of PAHs and PCBs in Parcel A soils were generally much lower than the levels observed on Parcel B.

Three main contaminated debris burial areas were confirmed by the RI. All three areas are on Parcel B. Buried debris consists mostly of coal tar fragments, milled wood, plastic, metal and concrete and several buried drums of solidified coal tar..

Soil underlying and surrounding the former plant buildings on Parcel B is also heavily contaminated. Soil in these areas was frequently stained and contained some accumulations of black oil and hardened coal tar.

The highest concentrations of PAHs and PCBs in surface soil are located in the northern portion of Plant 3. PAHs concentrations exceeded 1,000,000 ug/kg and PCBs were detected up to 870,000 ug/kg.

Concentrations greater than 100,000 ug/kg of high molecular weight PAH (HPAH) were found in subsurface soil down to the water table at about 6 feet below the ground. The highest levels of PAHs and PCBs in subsurface soil occur at Plant 3 and Plant 4, although localized, very high concentrations of HPAHs (>1,000,000 ug/kg) also occur along the west side of plant 2. The highest PCB levels (up to 400,000 ug/kg) were associated with black oily product at Plant 4. VOCs in subsurface soil were relatively low except at the southeast corner of Plant 3.

The upper 3 feet of soil across Parcel B has been moderately contaminated by PAHs and PCBs. Average HPAH and PCB concentrations in subsurface samples from test pits exceeded 25,000 ug/kg and 1,500 ug/kg respectively.

Relatively high levels of PAHs, PCBs, and Tetrachloroethene (PCE) were also detected in soil at the extreme southeast corner of Parcel B.

NOTE: As discussed earlier the cleanup options for groundwater will be presented in a separate Proposed Plan in the future. EPA will not propose cleanup of sediments or surface water because EPA evaluation shows no significant risk to people or the environment from these areas. Groundwater, surface water and sediments are described below to present a more complete picture of the site.

<u>Groundwater</u>
Chlorinated VOCs, principally PCE, are the primary contaminants in groundwater at the NWPC site. Trichloroethene (TCE), cis-1,2 dichloroethene (DCE), and vinyl chloride are also present in groundwater. Four plumes of VOC-contaminated groundwater exist in the shallow upper aquifer at the site.

<u>Surface Water</u>
Surface water in drainage ditches adjacent to the site is mildly impacted by chlorinated solvents. Most notably, PCE ranged from 0.3 to 0.9 ug/L in a drainage ditch that runs along the west boundary of the site (DC1) and was measured at 2 ug/L in a drainage ditch that runs along the east boundary of the site DC2. Levels of cis-1,2 DCE in DC1 and DC2 were also low. These observations indicate the likelihood of a connection between shallow PCE and DCE contaminated site groundwater and the adjacent surface water drainage channels.

TCE and cis-1,2 DCE were also detected in Dean Creek down gradient from the site, at levels of 1.0 ug/L and 3.0 ug/L respectively.

<u>Sediment</u>
Site related contaminants, principally PAHs and PCBs, are present in sediments in the drainage channels adjacent to the site. HPAHs up to 30,000 ug/kg and PCBs up to 5,800 ug/kg were detected in one drainage ditch (DC1) and at levels up to 2,700 ug/kg and 240 ug/kg respectively in a second offsite ditch (DC2). These same contaminants were observed at higher concentrations from off-site locations up-gradient from the site. This suggests that there are likely additional off-site sources of the PCBs and PAHs found in some of the sediments.

Sediment sampling in stations down gradient from the site show a decreasing trend for HPAHs and PCBs. Sediment In Dean Creek down gradient from the site contained HPAHs at 14,620 ug/kg and PCBs at 100 ug/kg.

SUMMARY OF SITE RISKS

As part of the Remedial Investigation and Feasibility Study, EPA conducted a baseline risk assessment to determine the potential current and future effects of contaminants on human health and the environment.

Actual or threatened releases of hazardous substances from this site, if not addressed by the preferred alternative or one of the other active measures considered, may present a current and/or future threat to public health, welfare, or the environment.

Human Health Risks

The NWPC site is currently zoned for light industrial use. Property adjacent and in proximity to the east and south of the site is used for a variety of commercial and industrial purposes. A small residential area is located approximately one-half mile southeast from the site.

Parcel B has been vacant since 1986. Although Parcel B is fenced and posted with warning signs, transients occasionally are observed on the site. The reasonably anticipated future land use at the site is expected to remain light industrial. Groundwater at and down-gradient from the site is not currently used nor is expected in the future to be used for drinking water. Businesses and residences in the site vicinity are generally connected to Clackamas County Water District.

Contaminated soil, if not cleanup up, poses a current and potential future risk to human health and the environment.

<u>Cancer Risks For Current Exposures</u>.
The risk assessment indicates that the *current* human population with the highest potential for increased cancer risk is the off-site transient resident ("transient trespasser"). A transient who trespasses onto the site may come in direct contact with soil on the site, or may have direct contact with or use surface water. EPA estimates that approximately 2 persons out of 100,000 people who trespass onto this site for a period of six months may develop cancer over their lifetime due to the contamination.

<u>Cancer Risks for Future Exposures</u>.
The future population with the highest potential for increased cancer risk is the on-site maintenance worker who may come in direct contact with soil on the site. EPA estimates that approximately 20 future on-sitemaintenance workers out of 100,000 workers may develop cancer due to the contamination.

These cancer risks from exposure to soil are primarily due to carcinogenic PAHs, PCBs, vinyl chloride, arsenic and beryllium. Concentrations of arsenic and beryllium are not generally elevated above background, therefore a substantial portion of the risks associated with these two metals may be attributed to background risks.

Non-Cancer Risks

Non-cancer risks are measured by an evaluation system, called the Hazard Index (HI), that generates a numeric value. Any value greater than 1.0 on the HI may indicate a need for action. The increased risk of noncancer health impacts for a transient that currently trespasses on the site is 14 on the HI. The increased risk of noncancer health impacts for a future onsite maintenance worker is 2 on the HI.

Ecological Risks

Ecological risks were assessed at this site through an evaluation of potential toxic effects on several plants and animals including the great blue heron, deer mouse, vagrant shrew, California quail, redtailed hawk, terrestrial plants and aquatic benthic invertebrates that might be exposed to soil, sediments and surface water contaminants at the site. The risk assessment indicates that no adverse effects are likely to occur to raptors feeding on small mammals at the site or to fish-eating birds that feed in the on-site drainage channels or off-site creeks. There is the potential for ecological effects to occur to small mammals, plant-eating birds and plants. Minimal effects on plants and animals in the off-site creeks is predicted. The soil contaminants accounting for the projected ecological risks include PAHs, PCBs, tetrachloroethene, dioxins/furans and some metals. A substantial portion of risks from metals is likely due to natural background levels.

REMEDIAL ACTION OBJECTIVES

Based on the site risks, EPA has established the following Remedial Action Objectives (RAOs) to prevent people from exposure to contaminated soil at the site:

- to prevent human exposure through direct contact (ingestion or contact) with contaminated soil that would result in an excess lifetime cancer risk greater than one in 1,000,000 for individual contaminants and above 1 in 100,000 for additive carcinogenic contaminants, or above a Hazard Index of 1.

- to prevent migration of contaminants in soil that would result in groundwater contamination that would result in human exposure through direct contact (ingestion, inhalation and dermal contact) with contaminated groundwater that would result in an excess lifetime cancer risk greater than one in 1,000,000 for individual contaminants, above 1 in 100,000 for additive carcinogenic contaminants, or above a Hazard Index of 1.

Provisional soil cleanup goals are being set for soils (see Table 1 below), and are protective of incidental ingestion and dermal contact for the current trespasser, future construction worker and future maintenance worker at the site. Soil cleanup goals are also set for PCE, TCE and vinyl chloride, based on protection of groundwater.

EPA is not setting soil cleanup goals for the protection of ecological receptors at the site. EPA believes that the small mammals and the plant community which may inhabit the site are not receptors of concern because of the likelihood that the site will be redeveloped for industrial or commercial uses.

Table 1:
Soil Cleanup Goals
(Fg = micrograms)

Contaminant	Cleanup Goals (mg/kg)
Benzo(a)anthracene	2,500
Benzo(b)fluoranthene	2,500
Benzo(k)fluoranthene	2,500
Benzo(a)pyrene	250
Chrysene	250,000
Dibenz(a,h)anthracene	250
Indeno(1,2,3-cd)pyrene	2,500
Tetrachloroethene (PCE)	7
Trichloroethene (TCE)	13
Vinyl Chloride	0.1
Total PCBs	1,000

ALTERNATIVES FOR SOILS CLEANUP

The eleven alternatives developed by EPA are summarized below. The Feasibility Study report presents a complete description of these alternatives and is available at the site information repositories. See page 15 for locations and telephone numbers.

Alternative Soils 1 (S1) - No Action

The no action alternative provides a baseline for comparing other alternatives. It establishes the risk levels and site conditions if no remedial actions are implemented. Under the no action alternative Site conditions and risk levels would remain as they currently exist. No changes or restrictions would be made that would affect activities at the Site. No engineering or institutional controls would be put in place and no remedial actions would be initiated to reduce hazard levels at the site. Land development, site maintenance, and site improvements would continue without regard to site conditions.

Alternative S2 - Excavation and Off-Site Disposal

This alternative consists of removing all Parcel B soil exceeding the provisional soil cleanup goals to an off-site facility for disposal. The excavated areas would be filled with clean material and then hydroseeded to establish a vegetative cover. A total of 257,750 cubic yards would be excavated, including 103,250 cubic yards from the top two feet and 154,500 cubic yards from the deeper contaminated areas. The maximum excavation depth is 9 feet bgs in all areas, which is the limit of soil data gathered in the remedial investigation. Excavated soil would be transported to either a RCRA Subtitle C or D landfill, based upon the concentrations of contaminants of concern (COC) in the soil. Approximately 120 cubic yards of soil may require ex-situ on-site soil vapor extraction treatment to reduce the PCE concentrations prior to off-site disposal.

Site structures and subsurface features such as USTs and in-ground piping would be removed or managed on site. Soil piles 3 and 4 would be disposed off-site, while Soil Pile 2 would be used as backfill. If needed to prevent ponding or erosion caused by rainfall, a surface water drainage system for Parcel B would be constructed.

Alternative S3 - Capping

This alternative consists of capping the entire 32-acre Parcel B with 2 feet of clean topsoil and vegetation over to prevent human exposure to the underlying soil contaminants. Although small areas of surface soil scattered throughout the site already meet the soil cleanup goals, the cap would cover these areas to increase Implementability and ease of maintenance. Site features that would interfere with cap placement would be removed or managed. Capping would require 103,000 cubic yards of imported soil. If needed to prevent ponding or erosion, a surface water drainage system would be constructed.

Periodic inspections and necessary maintenance of the cap would be performed to ensure the long-term integrity of the cover is preserved. Since contaminated soil would remain, institutional controls such as deed notices, deed restrictions or restrictive covenants on Parcel B would be implemented to prevent intrusive activities into the underlying soil and to warn of the subsurface soil contaminant hazards. Future development or reuse of Parcel B would be limited to those uses which would not compromise the protectiveness of the soil cap.

S4 ALTERNATIVES

The four S4 alternatives (S4a, S4b, S4c and S4d) consist of excavating soil that meets Oregon DEQ’s definition of hot spots, and then applying one of several different treatment and disposal methods to the excavated soil. Hot spots are areas of soil in which the contaminants are either “highly concentrated, highly mobile or not reliably containable” as identified by the State of Oregon Environmental Cleanup Rules. Table 2 shows contaminant levels defined as Oregon Hot Spots for the site.

Table 2: Oregon Hot Spot Levels

Contaminant	(Fg/kg)	Contaminant	(Fg/kg)
Benzo(a)anthracene	250,000	Indeno(1,2,3-cd)pyrene	250,000
Benzo(b)fluoranthene	250,000	Tetrachloroethene (PCE)	39
Benzo(k)fluoranthene	250,000	Trichloroethene (TCE)	40
Benzo(a)pyrene	25,000	Vinyl Chloride	9
Chrysene	25,000,000	Total PCBs	20,000
Dibenz(a,h)anthracene	25,000		

All four S4 alternatives provide that

- prior to and during excavation, site structures and subsurface features such as USTs and piping would be removed or managed on site.
- because soil with COC concentrations exceeding provisional cleanup goals would still exist on-site after removal of Oregon Hot Spots, Parcel B would be capped with two feet of clean material to prevent human exposure to the remaining underlying soil contaminants. Capping would require 103,000 cubic yards of imported soil. If needed to prevent ponding or erosion, a surface water drainage system would be constructed.
- periodic inspections and necessary maintenance of the cap, described above, would be performed to ensure the long-term integrity of the cover is preserved. Since some contaminated soil on Parcel B would remain untreated, institutional controls such as deed restrictions or restrictive covenants would be implemented to prevent intrusive activities into the soil underlying the cap and to warn of the subsurface soil contaminant hazards.

Alternative S4a - Oregon Hot Spots Excavation and Disposal

This alternative consists of excavating Oregon Hot Spots and disposal in an off-site facility. The excavated areas would be filled with clean material and the entire Parcel B would be capped with clean topsoil and vegetation.

Approximately 32,600 cubic yards of soil would be excavated and removed. Excavated soil would be transported to either a RCRA Subtitle C or D landfill, based upon the concentrations of COCs in the soil. Approximately 120 cubic yards of soil may require on-site soil vapor extraction treatment first to reduce the PCE concentrations prior to off-site disposal.

Alternative S4b - Oregon Hot Spots Excavation and On-Site Thermal Desorption

This alternative consists of excavating Oregon Hot Spots and treating the excavated soil using an on-site mobile thermal desorber. The excavated areas would be filled with the treated soil and the parcel would be capped with clean topsoil and vegetation to prevent exposure to the remaining underlying soil contaminants.

Although thermal desorption would dramatically reduce soil contaminant concentrations, soil exceeding the provisional cleanup goals would still remain on Parcel B. To meet soil RAOs, Parcel B would be capped with 2 feet of clean topsoil (requiring 103,000 cubic yards of imported soil) and vegetation established by hydroseed. This would prevent human exposure to both the remaining contaminants in untreated soil as well as any residual contaminants in treated soil.

Prior to full-scale operation, the mobile thermal desorber requires a proof of performance test. This test is site-specific and would require the thermal desorber to be on-site. Results of the on-site test may necessitate modification of this alternative to include another form of treatment or disposal for soils with high PCB concentrations.

Alternative S4c - Oregon Hot Spots Excavation and Off-Site Thermal Desorption/Incineration of Soils

Exceeding Desorber Limits

This alternative consists of excavating Oregon Hot Spots and treating the soil at an off-site thermal desorption facility or an incinerator. Soil with concentrations greater than 50,000 ug/kg PCB or 1,000 ug/kg PCE would be transported to an off-site incinerator for treatment, and soil with lower PCB/PCE concentrations would be transported to an off-site thermal desorber for treatment. The excavated areas would be filled with the treated soil from the thermal desorption facility and Parcel B would be capped with 2 feet of clean topsoil and hydroseeded to establish vegetation to prevent human exposure to the remaining underlying soil contaminants.

Alternative S4d - Oregon Hot Spots Excavation and Off-Site Thermal Desorption/Landfill Disposal of Soils Exceeding Desorber Limits

This alternative consists of excavating Oregon Hot Spots and treating excavated soil at an off-site thermal desorption facility. Soil with concentrations greater than 50,000 ug/kg PCB or 1,000 ug/kg PCE, or with TCLP concentrations for metals that exceed the RCRA thresholds would be transported and disposed in a TSCA-compliant RCRA Subtitle C landfill. Soil with concentrations lower than these thresholds would be transported to an off-site thermal desorber for treatment. The total volume of Oregon Hot Spot soil is 32,600 cubic yards. Of this amount, approximately 4,050 cubic yards of soil would require Subtitle C disposal. Approximately 120 cubic yards of surface soil near the southeast corner of Plant 3 may require on-site soil vapor extraction treatment to reduce the PCE concentrations prior to off-site disposal.

The excavated areas would be filled with the treated soil from the thermal desorption facility and the parcel would be capped with 2 feet of clean topsoil and hydroseeded to establish vegetation to prevent human exposure to the remaining underlying soil contaminants.

S5 ALTERNATIVES

Similar to the S4 alternatives, the S5 alternatives (S5a, S5b, S5c and S5d) also include excavating contaminated soil and then applying one of several different treatment and disposal methods to the excavated soil. Under S5, however, the Remedial Action Objectives are met by removing a greater quantity of contaminated soil (compared with S4) such that residual soil remaining would be clean enough that a cap over the site would not be needed. Thus, in contrast to the S4 alternatives, the S5 alternatives do not include the placement of a soil cap over Parcel B after excavation and backfill.

The fifteen soil areas excavated under S5 are designated “hybrid” areas because the criteria defining them used a variety of approaches, including: the resulting site residual risk, the relationship between contaminant mass and volume removed, EPA PCB Cleanup Policies, and the “highly mobile” Oregon Hot Spot thresholds. The hybrid thresholds are shown in Table 3.

Table 3: Hybrid Threshold Levels

Contaminant	(Fg/kg)
Benzo(a)pyrene	1,600
Field Total HPAHs	200,000
Field and Lab Total PCBs	20,000
Tetrachloroethene (PCE)	39
Trichloroethene (TCE)	40
Vinyl Chloride	9

Alternative S5a - Hybrid Excavation and Off-Site Disposal

This alternative consists of excavating the fifteen hybrid areas and disposal in an off-site landfill. The excavated areas would be backfilled with clean material.

Approximately 69,850 cubic yards of soil would be excavated and removed. Excavated soil would be transported to either a RCRA Subtitle C or D landfill, based upon the concentrations of COCs in the soil. Approximately 120 cubic yards of soil may require on-site soil vapor extraction treatment first to reduce the PCE concentrations prior to off-site disposal.

Prior to and during excavation, site structures and subsurface features (e.g., USTs, concrete debris) would be removed or managed on site. If needed to prevent ponding or erosion, a surface water drainage system would be constructed after earthwork has been completed.

Alternative S5b - Hybrid Excavation and On-Site Thermal Desorption

This alternative consists of excavating Hybrid alternative areas and treating the excavated soil using an on-site mobile thermal desorber. The excavated areas would be backfilled with the treated soil. The excavation areas and depths are the same as Alternative S5a.

Prior to full-scale operation, the mobile thermal desorber requires a proof of performance test. This test is site-specific and would require the thermal desorber to be on-site. Results of the on-site test may necessitate modification of this alternative to include another form of treatment or disposal for soils with high PCB concentrations.

Site features (e.g., USTs, concrete debris) would be addressed as discussed for Alternative S5a, except that the existing investigation-derived waste (IDW) would be removed from drums and thermally desorbed on-site.

Alternative S5c - Hybrid Excavation and Off-Site Thermal Desorption / Incineration of Soils Exceeding Desorber Limits

This alternative consists of excavating the Hybrid alternative areas and treating the excavated soil at an off-site thermal desorption facility or an incinerator. Soil with concentrations greater than 50,000 ug/kg PCB, 1,000 ug/kg PCE, or with TCLP concentrations for metals that exceed the RCRA thresholds would be transported to an off-site incinerator for treatment. Soil with concentrations lower than these thresholds would be transported to an off-site thermal desorber for treatment. Approximately 4,050 cubic yards of soil would require treatment by incineration. Incinerated soil byproducts would be disposed by the treatment facility. The excavated areas on Parcel B would be backfilled with the treated soil from the thermal desorption facility, supplemented with imported clean fill.

Site features (e.g., USTs, concrete debris) would be addressed as discussed for Alternative S5a, except that the existing investigation-derived waste (IDW) would be removed from drums and thermally desorbed off-site.

Alternative S5d - Hybrid Excavation and Off-Site Thermal Desorption / Landfill Disposal of Soils Exceeding Desorber Limits

This alternative consists of excavating Hybrid alternative areas and treating excavated soil at an off-site thermal desorption facility. The excavated areas would be filled with the treated soil returned from the thermal desorption facility, supplemented by imported clean fill. Soil with high levels of PCBs that cannot be treated by thermal desorption would be disposed in a TSCA-compliant RCRA Subtitle C landfill. Soil with concentrations greater than 50,000 ug/kg PCB or 1,000 ug/kg PCE, or with TCLP concentrations for metals that exceed the RCRA thresholds would be transported to an off-site RCRA Subtitle C landfill for disposal. Soil with concentrations lower than these thresholds would be transported to an off-site thermal desorber for treatment. Approximately 4,050 cubic yards of soil would require Subtitle C disposal. Due to land disposal restrictions, approximately 120 cubic yards of surface soil near the southeast corner of Plant 3 may require on-site soil vapor extraction treatment to reduce the PCE concentrations prior to off-site disposal.

Site features (e.g., USTs, concrete debris) would be addressed as discussed for Alternative S5a, except that the existing investigation-derived waste (IDW) would be removed from drums and thermally desorbed off-site.

CRITERIA USED BY EPA TO EVALUATE ALTERNATIVES

EPA's Superfund program uses nine nationally established criteria to evaluate and compare cleanup alternatives. The evaluation tables that follow describe each of the criteria. The criteria are divided into three categories as follows:

Threshold Criteria

- Overall Protection of Human Health and the Environment
- Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

The alternative that EPA chooses must comply with the threshold criteria.

Balancing Criteria

- Long-Term Effectiveness and Permanence
- Reduction of Toxicity, Mobility, or Volume through Treatment
- Short-Term Effectiveness
- Implementability
- Cost

These five criteria are used by EPA to choose between alternatives which meet the threshold criteria.

Modifying Criteria

- State Acceptance
- Community Acceptance

EPA uses the information received from the community and the Oregon Department of Environmental Quality to determine if new information or additional considerations warrant a change to the preferred alternative.

Once the alternatives have been evaluated using these criteria EPA selects an alternative. EPA then issues a Record of Decision (ROD) to document the selection. The site then proceeds to the design and construction phase.

EVALUATION OF ALTERNATIVES

The following tables summarize the soil cleanup alternatives and provide a narrative description comparing the alternatives with one another under each criterion. As shown in the tables, the "no action" alternative does not provide overall protection of human health and the environment, nor does it meet ARARs for the Site. Because EPA cannot select an alternative which does not satisfy these criteria, this alternative is not carried forward for evaluation beyond the threshold criteria.

Please note that this Proposed Plan only summarizes EPA's evaluation. The full detailed analysis performed for the Site can be found in the Feasibility Study Report. This text focuses on the **key distinguishing factors** EPA considered in ultimately selecting its Preferred Alternative.

Overall Protection of Human Health and the Environment

Determines whether a remedial action eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.

ALTERNATIVES (ranked from highest to lowest)	Discussion
S2	Alternative S2 affords the most overall protection by removing all soil exceeding cleanup goals from the site.
S5a,b,c,d	Alternatives S5a through S5d offer more protection than all but alternative S2 by removing even more soil while avoiding the need to rely upon institutional and engineering controls (site cap) to protect against exposure to contaminants remaining onsite
S3 S4a,b,c,d	Alternative S3 (site cap) reduces potential human exposure to site contaminants through a clean soil cap. Alternatives S4a through S4d provide protection by removing the majority of contaminated soil from the site and isolate remaining contaminated soil under a cap.
S1	Alterative S1(no action) does not meet the threshold criterion of protection of human health and the environment.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Evaluates whether an alternative meets state and federal environmental laws & regulations pertaining to the site.

ALTERNATIVES (ranked from highest to lowest)	Discussion
S2, S3 S4a,b,c,d S5a,b,c,d	All alternatives except S1 would be designed to meet applicable, or relevant and appropriate, criteria or standards. (Note: compliance with the TSCA ARARs for PCB disposal will be met through the risk-based disposal option of 40 CFR § 761.41.)
S1	Does not meet ARARs

Long-Term Effectiveness and Permanence

Considers the ability of a remedial action to maintain protection of human health and the environment over time and the reliability of such protection.

ALTERNATIVES (ranked from highest to lowest)	Discussion
S2	Alternative S2 is considered most protective because it removes from the site all soil exceeding the cleanup goals and requires no ongoing operations, maintenance or monitoring after completion.
S5a,b,c,d	Alternatives which maximize contaminant destruction or removal (Alternatives S2, and S5a through S5d) will provide the highest level of long-term protection of human health and the environment because they do not rely upon maintenance of a site cap to reduce the risks posed to future site occupants. However, Alternatives S5a through S5d would allow some contaminants to remain on-site at levels slightly exceeding cleanup goals.
S4a,b,c,d	Alternatives S4a through S4d (excavation and off-site treatment and cap) afford more long term protection than capping alone because they remove and destroy a significant amount of contamination.
S3	Alternative S3 (site cap) is considered lower in long-term effectiveness because there is no reduction of contaminant concentrations through treatment prior to capping and the potential for exposure exists if the cap fails.

Reduction of Toxicity, Mobility, or Volume through Treatment

Evaluates a remedial action's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment and the amount of residual contamination remaining.

ALTERNATIVES (ranked from highest to lowest)	Discussion
S5b,c,d S4b,c,d	Alternatives involving treatment to reduce contaminant toxicity, mobility and volume (S4b, S4c, S4d, S5b, S5c, S5d) rate highest for this criterion. These alternatives use thermal desorption to destroy the soil contaminants and containment to reduce the mobility of contaminants not destroyed by treatment. Among these treatment alternatives, S5b, S5c, and S5d rate slightly better because they remove and destroy a larger quantity of contaminants (HPAHs and PCBs) than S4b, S4c and S4d.
S2 S4a S5a	Alternatives S2, S4a, and S5a rate lower than the treatment alternatives because they rely solely on containment (in a landfill) to reduce the mobility of contaminants.
S3	Alternative S3 would not utilize any treatment of the principal contaminants.

Short-Term Effectiveness

Considers how fast a remedial action reaches the cleanup goal and the risk that the remedial action poses to workers, residents, and the environment during the construction or implementation of the remedial action.

ALTERNATIVES (ranked from highest to lowest)	Discussion
S3	Alternative S3 (site cap) provides the greatest short-term effectiveness because it can be implemented the most quickly and does not require the off-site transport of contaminated soil.
S4a, S5a	Alternatives S4a and S5a (offsite landfill) have a lower short-term effectiveness because they require off-site transport of contaminated soil.
S5c,d S4c,d	Alternatives S4c, S4d, S5c and S5d could be implemented quickly, because a local thermal desorption facility is available. However, Alternatives S4c and S4d include a soil cap placement after Remediation, thus extending the time to completion of the soil remedy.
S2 S4b S5b	Alternative S2 (excavation and off-site disposal) could have a significant short-term impact due to the extensive amount of excavation and corresponding truck traffic. Alternatives S4b and S5b (excavation and on-site thermal treatment) will likely have a much longer implementation time and pose the greatest risk of short-term impacts and exposure to workers and the surrounding community.

Implementability

Considers the technical and administrative feasibility of implementing a remedial action, such as relative availability of goods and services. This criterion also considers whether the technology has been used successfully at other similar sites.

ALTERNATIVES (ranked from highest to lowest)	Discussion
S3 S4a S5a	Alternatives S3 (cap) and S2 , S4a and S5a (excavation and off-site disposal) involve the most readily implementable and reliable technologies.
S2 S4c,d S5c,d	Alternative S2 may be very difficult to implement because a large number of trucks and a large borrow site are required. Alternatives S4c, S4d, S5c and S5d (excavation and off-site treatment) are readily implementable since there is a thermal desorption facility locally available.
S4b S5b	Alternatives S4b and S5b (excavation and on-site treatment) may be more difficult to implement because they require use of a treatment technology provided by only a few vendors and due to the coordination and time required to obtain necessary approvals. Alternatives involving thermal treatment require a treatability study before being implemented.

Cost

Includes estimated capital, operation and maintenance costs.

Cost of Soil Alternatives (based on 30 years)

All amounts adjusted to present value (millions of dollars)

Alternative	Capital Costs	Operation and Maintenance Cost	TOTAL
S2	$26.5	$0.0	$26.5
S3	$2.9	$0.05	$2.9
S4a	$6.8	$0.05	$6.9
S4b	$9.7	$0.05	$9.8
S4c	$10.5	$0.05	$10.6
S4d	$6.7	$0.05	$6.8
S5a	$7.9	$0.0	$7.9
S5b	$14.4	$0.0	$14.4
S5c	$11.5	$0.0	$11.5
S5d	$7.7	$0.0	$7.7

State & Community Acceptance

EPA will consider all public comments received, as well as additional input from the State of Oregon prior to selecting the final remedy. The Preferred Alternative may be modified based on new information received or additional factors.

SUMMARY OF EPA'S PREFERRED ALTERNATIVE

The preferred alternative for soil cleanup at the NWPC site includes excavation and off-site thermal treatment/landfill of contaminated soil exceeding Oregon Hot Spots (Soil Alternative S4d). Other components of the preferred alternative include; a soil cap on Parcel B; removal or on-site management of site features; institutional controls to restrict contact with contaminated soil; and monitoring of the soil cap. Timing of final placement of the soil cap would be coordinated with any future groundwater cleanup actions to minimize disruptions to the cap.

Alternative S4d is the preferred soil alternative because it achieves substantial human health risk reduction by both treating the principal threat wastes (the highly contaminated soil) in a cost-effective manner and providing safe long-term management of remaining contaminated soil. This combination reduces risk sooner and costs less than other alternatives.

The preferred alternative would significantly reduce the risks posed by the current site conditions. Human health risk to the current transient trespasser would be reduced by two orders of magnitude, and human health risks to future on-site construction and maintenance workers would be reduced by one order of magnitude. The post-Remediation noncancer hazard index (HI) for the future on-site construction worker and the future off-site child resident exceed 1.0, indicating a slightly increased likelihood of adverse health effects remaining.

Actual post-Remediation risks most likely will be further reduced through the use of engineering and institutional controls. The preferred alternative includes a soil cap on Parcel B which, as long as the its integrity is maintained, will effectively eliminate or greatly reduce human exposure to untreated and treated soil remaining at the site.

Based on information currently available, EPA and the State of Oregon DEQ believe the Preferred Alternative provides the best balance of tradeoffs among the alternatives with respect to the evaluation criteria. The EPA expects the preferred alternative to satisfy the statutory requirement in CERCLA section 121(b) to: 1) be protective of human health and the environment; 2) comply with ARARs; 3) be cost-effective; 4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and 5) satisfy the preference for treatment as a principal element.

The estimated cost of the Preferred Alternative is as follows:

Capital Costs:	**$6.7 million**
Operation and Maintenance Costs	**$0.05 million**
Total Costs:	**$6.8 million**

The preferred alternative could change based on public comment and/or new information.

For More Information

Copies of studies quoted in this document and other materials about the Northwest Pipe and Casing/Hall Process Site , including the site administrative record, will be available after January 30, 2000 at the:

Clackamas Corner Branch Library
11750 SE 82nd Avenue, Suite D
Clackamas, Oregon.
503 722-6222
The library is at the NE corner of the Clackamas Town Center Mall parking lot.

US EPA Oregon Operations Office
811 SW Sixth Avenue, 3rd Floor
Portland, Oregon
503 326-3250
The office is located in downtown Portland.

If you have questions call EPA:

Robert Drake, Community Relations Coordinator . . . . **Toll Free 1-800 424-4EPA**
E-Mail Address: DRAKE.ROBERT@EPA.GOV **or (206) 553-4803**

Al Goodman, EPA Project Manager . . . .**(503) 326-3685**
E-Mail Address: GOODMAN.AL@EPA.GOV

Additional services can be made available on request to persons with disabilities by calling 1-800-424-4EPA.

Visit the EPA Region 10 Internet Home Page at: **www.epa.gov/r10earth**
Information about the Northwest Pipe and Casing - Hall Process Company Superfund Site is available at:

http://epainotes1.rtpnc.epa.gov:7777/r10/cleanup.nsf/webpage/ Northwest+Pipe+and+Casing+Company-Hall+Process+Company

or by clicking on “Index”, and selecting
“Northwest Pipe and Casing-Hall Process Company Superfund Site”

EPA

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Northwest Pipe and Casing/Hall Process Company Superfund Site
Proposed Plan